

## **Chapter 7**

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# **Flow and Loading Reduction Alternatives**

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### FLOW AND LOADING REDUCTION ALTERNATIVES

#### 7.1 INTRODUCTION

The identification of flow and loading reduction alternatives for water and sewer services is important in order to minimize the expense of new (or modified) facility construction. These alternatives can also conserve water and minimize impact to natural resources. Reduction of wastewater flows and loadings to on-site septic systems can also reduce the impact of pollutant discharges to groundwater and surface waters downgradient of recharge areas.

The purpose of this chapter is to review methods that could be utilized to reduce the wastewater volume and pollutant loadings generated by residential and non-residential sources.

#### 7.2 INFILTRATION AND INFLOW (I/I) REDUCTION

A. **Summary of I/I Evaluations.** The Needs Assessment Report calculated that the estimated I/I flow to the Falmouth WWTF is 210 gpd/inch mile (gpdim) which is below the typical range of 250 to 500 gpdim as indicated by the New England Interstate Water Pollution Control Commission (NEIWPCC) in their “Guides for the Design of Wastewater Treatment Works”. The Town DPW WPCD provides regular cleaning, inspection, and maintenance on the collection system and this commitment to maintenance is a reason why this I/I parameter is below the expected I/I range.

The Town plans to continue these services to maintain low I/I which in turn maintains high treatment capacity.

### 7.3 REDUCTION OF HOUSEHOLD WATER CONSUMPTION

A. **Public Education Programs.** The Town currently encourages water conservation by a variety of methods. Information on low flow devices and other conservation methods to reduce water use is available at local libraries, schools, and as part of information delivered with water bills. The Town has also imposed voluntary and mandatory water conservation during peak usage times and periods of limited rainfall. The Town Building Department is responsible for ensuring water conservation methods are implemented during new construction, including the installation of low flow devices. The Town has also made significant efforts to track leaks in the system and perform routine maintenance to minimize water losses.

B. **Plumbing Codes and Water Reduction Devices.** Water use and wastewater flows from households may be reduced through the utilization of household water-saving devices. Some of the devices available are water saver toilets, reduced flush toilets, vacuum flush toilet systems, washwater recycling systems for toilet flushing, faucet aerators, flow limiting valves, and pressure reducing valves.

Approximately 70 percent of the total volume of wastewater generated within the average home is derived from the toilet, laundry, and bath. The most substantial water-saving and wastewater reductions can be made in these areas. Water saving toilets, reduced flush devices, and restricted flow showerheads are common water-saving devices.

Water-saving devices are more expensive than standard fixtures and would probably not be installed by homeowners without external incentive. However, the use of such devices by individual customers should be encouraged in new construction or as replacements for improperly functioning devices. State building codes now require the installation of low flow devices during new construction.

### 7.4 PRICING POLICY FOR WATER AND WASTEWATER SERVICE

Pricing policies for water and wastewater service are currently structured to discourage water consumption (wastewater generation). The Town plans to continue this current water pricing rate, which tends to encourage water conservation and therefore discourage water consumption.

## 7.5 WASTEWATER REUSE AND RECYCLING

Lawns could potentially be watered with reclaimed wastewater to conserve the use of clean water and minimize the amount of treated water that needs to be recharged. Currently, reclaimed water use is regulated by MassDEP and the reuse of treated wastewater is allowed for irrigation, recreational use, industrial or commercial cooling or air conditioning, toilet flushing, agricultural use, creation of wetlands, commercial laundries, carwashes, industrial boiler feed, silviculture, snowmaking, fire protection, dust control, soil compaction, street cleaning, and aquifer recharge.

Golf courses and Town-owned properties can be irrigated with treated effluent if the effluent is adequately treated and proper precautions are taken to avoid human contact with the irrigation water, as regulated by 314 CMR 20 Reclaimed Water Permit Program and Standards. This approach conserves clean water that would have been used for this same use. However, it does not eliminate the need for other treated water recharge facilities, because redundant facilities are required when golf courses and public lands are being used by the public and during time periods when irrigation cannot be used. Golf courses will be considered for irrigation with treated wastewater as identified in Chapter 5.

Treated wastewater is often also used as process water for local industries. This scenario is not promising in Barnstable since there are no large industries that utilize large volumes of process water.

## 7.6 REDUCTION OF WASTEWATER LOADINGS

The opportunities for reducing wastewater pollutant loadings are limited to the non-sanitary components of wastewater. The loadings associated with food wastes are added into wastewater when garbage grinders are installed in kitchen sinks. The wastewater loading associated with food can be significant. This load could be reduced by disposing of food waste as a solid waste or using a household composting unit. The use of garbage grinders in homes with septic systems contributes additional nitrogen to the groundwater and increases the solids loading to the septic tank, requiring more frequent pumping.

Commercial and industrial businesses may also have opportunities to reduce wastewater loadings to the Barnstable WPCF (or their own septic systems) by reprocessing of non-sanitary waste

byproducts from their operations. Individual businesses need to determine if any wastes could be recycled, reused, or disposed of as a solid waste instead of adding them to the wastewater flow.

## **7.7 WATERLESS TOILETS**

Waterless toilets (composting and incinerating toilets) were discussed in Chapter 3. These toilets provide flow and loading reductions because they do not utilize water and they convert sanitary wastes to solid waste or to a usable soil conditioner. As discussed in Chapter 3, these toilets are not considered a feasible solution for watershed-wide application because they are typically not well suited to handle high seasonal flows and loadings, and there is usually poor public acceptance of handling composted or incinerated human waste. A public health threat could occur if the systems were implemented on a large scale without proper operation, management, and waste disposal. These systems may be suitable for isolated areas and informed individuals who are willing to take on the significant responsibility of the systems.

## **7.8 GROWTH MANAGEMENT REGULATION**

Following sewer installations in any of the planning areas, increased growth could conceivably occur as a direct result of the removal of the current growth limitation that on-site systems may have provided. Currently, Title 5 regulations control the number of bedrooms allowed per acre. If these areas are sewered, Title 5 regulations may no longer apply. To counteract this potential increased growth, zoning modifications could be instituted to regulate development and remain in accordance with the Town's LCP. Zoning modifications can also be used to limit growth in other areas to prevent future nitrogen discharges into sensitive embayments. These zoning modifications could include increasing the allowable minimum lot sizes and establishing restrictions on building sizes and uses.

The 2009 Environmental Board Act (also known as the O'Leary Bill due to Senator Robert O'Leary's efforts to promote this legislation) provides 0% interest loans through the State Revolving Fund (SRF) low interest loan program to eligible communities. One of the criteria for eligibility is to have a growth neutral bylaw or regulation that will prevent increased growth beyond the growth that is currently allowed. MassDEP will soon release regulations that define the requirements of these Growth Neutral Controls. The Town needs to consider growth

management regulations to maintain eligibility for the 0% loans and to meet the Town vision and goals as articulated in the Town's Local Comprehensive Plan (LCP) summarized in Chapter 1.

## **7.9 SUMMARY**

By means of the Barnstable Comprehensive Plan, the Town of Barnstable has goals and policies in place that encourage the conservation of water. Opportunities to reduce wastewater loadings are mainly the reduction of food wastes or other non-sanitary wastes. Continued sewer inspections and repairs are recommended to maintain the low observed I/I. It is recommended that the Town continue with its practices of public education and enforcement of the building codes to encourage water conservation, and proceed with the necessary Growth Neutral Controls once the States regulatory requirements are promulgated.